



Australian Government

BEST AVAILABLE COPY

REC'D 21 APR 2004

WIPO

PC

**PRIORITY
DOCUMENT**

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

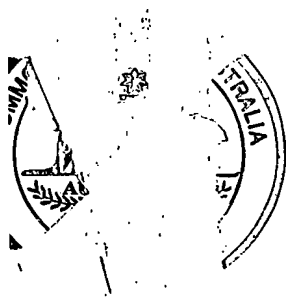
Patent Office
Canberra

I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND
SALES hereby certify that annexed is a true copy of the Provisional specification
in connection with Application No. 2003901440 for a patent by KYM JOHN
KEIGHTLEY as filed on 28 March 2003.

WITNESS my hand this
Seventh day of April 2004

A handwritten signature in cursive script that reads "J. Billingsley".

JULIE BILLINGSLEY
TEAM LEADER EXAMINATION
SUPPORT AND SALES



11875

P/00/009
Regulation 3.2

AUSTRALIA
Patents Act 1990

ORIGINAL

PROVISIONAL SPECIFICATION FOR AN INVENTION ENTITLED:

Invention Title: An improved hole saw boss
Name of Applicant: Kym John Keightley
Address for Service: LESICAR PERRIN, 49 Wright Street, Adelaide, SA 5000

The invention is described in the following statement:

An improved hole saw boss

The present invention relates to an improved hole saw boss and in particular, to a boss including a threaded member adapted to accommodate two hole saws of the same or different bore thread diameter.

5 BACKGROUND OF THE INVENTION

Drills are typically used by tradesmen and home handymen to perform a multitude of various tasks. The most common task is generally the drilling of holes into various materials. Drill bits are designed such that they are very effective in this process whereby the rapid rotation of the bit effectively cuts away at the work piece thereby forming an aperture. These drill bits, which are typically locked within a mandrel are effective for apertures of a small diameter, however, it is often required that much larger apertures be drilled.

This is where the invention of the hole saw came into being which incorporates a cylindrically shaped member including cutting teeth on one end and a threaded bore on the other. This threaded bore engages with an oppositely threaded member connected to the mandrel commonly referred to as a boss. The drill bit is incorporated into the hole saw assembly and protrudes through the boss a distance greater than that of the hole saw member so that it can be used to align the drill with the centre of the circle being cut. That is, when using a hole saw member to drill a hole into a work piece, it is much easier to align a pilot drill with a centre point of a circle than it is to align the cutting teeth of a hole saw member with the perimeter of a circle. The pilot drill forms an initial hole in the work piece until the hole saw teeth reach the material surface where they then proceed to accurately drill the required hole.

Although this has proven to be an effective method of drilling larger holes, it becomes apparent that when faced with having to increase the diameter of an existing hole, there exists no centre-point to which a pilot drill may be aligned. This provides a problem because as mentioned, it is very difficult to accurately drill a large-diameter hole without some type of centre alignment. In many situations, the handyman is forced to manually hand-work the work piece so that enlargement can be achieved.

It is an object of the present invention to overcome at least some of the aforementioned problems or to provide the public with a useful alternative.

Insofar as the applicant is aware, there exists no hole saw boss including a threaded member adapted to accommodate two hole saws of the same or different diameter threaded bore.

SUMMARY OF THE INVENTION

- 5 Therefore in one form of the invention there is proposed an improved hole saw boss including a threaded member said threaded member adapted to accommodate at least two hole saws of different cutting diameter.

 Preferably each hole saw includes a threaded bore adapted to engage said threaded member.

- 10 Preferably, said boss includes a base member to which the threaded member is connected.

 Preferably, said threaded member consists of a first section and at least one other section of stepped down diameter to accommodate hole saw of different threaded bore diameters.

- 15 Preferably, said section diameters correspondingly engage with commonly available hole saw threaded bore diameters.

 Preferably, at least one section is of a length capable of accommodating more than one hole saw of different cutting diameter.

- 20 Preferably, said base member and threaded member include a central aperture adapted to allow a drill bit to fit there through.

 Preferably, said boss includes a connection means to a mandrel.

 Preferably, said second hole saw is chosen to fit snugly within an existing aperture of a work piece.

- 25 Preferably, said first hole saw is adapted to drill a hole larger than the existing hole into the work piece.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate several implementations of the invention and, together

with the description, serve to explain the advantages and principles of the invention. In the drawings,

- Figure 1 is an exploded perspective view of a hole saw assembly embodying the present invention and including a single threaded member;
- 5 Figure 2 is a perspective view of the hole saw assembly of Figure 1 applied to a work piece;
- Figure 3 is a perspective view of the double-diameter boss of the present invention including a mandrel connection means;
- Figure 4 is a side view of the hole saw boss of Figure 3;
- 10 Figure 5 is a top view of the hole saw boss of Figure 3; and
- Figure 6 is a side view of the hole saw boss rotated 90° to that shown in Figure 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

15 The following detailed description of the invention refers to the accompanying drawings. Although the description includes exemplary embodiments, other embodiments are possible, and changes may be made to the embodiments described without departing from the spirit and scope of the invention. Wherever possible, the same reference numbers will be used throughout the drawings and the following description to refer to the same and like parts.

20 The present invention discloses a hole saw boss 10 including a threaded member 12 adapted to accommodate two hole saws. Moreover, member 12 may be adapted to include a first threaded section 14 and a second threaded section 16 of stepped down diameter, an arrangement that allows for hole saws with differing bore thread diameters to be connected thereto. In both cases, threaded member 12 is

25 adapted to engage both an outer hole saw 18 and an inner hole saw 20 respectively of different diameter cutting sizes. When the diametric enlargement of an existing aperture 22 in a work piece 24 is required, the inner hole saw 20 seeks to minimise any unfavourable lateral movement of the outer hole saw 18 during initial contact with the work piece surface 26, since it protrudes beyond the outer hole saw 18.

Illustrated in Figures 1 and 2 is a hole saw assembly utilising a hole saw boss the subject of the present invention. For details of the hole saw assembly the reader is referred to applicants International Patent Application PCT/AU02/01296 whose content is incorporated by reference herein

5 Figure 1 illustrates an exploded view of a hole saw assembly including the boss 10 of the present invention. The hole saw assembly 28 includes a shank 30, a mandrel 32 (or driving means), a drill bit 33, and an annulus 34 (or locking ring) that locks the boss 10 to the mandrel 32. Figures 2-6 illustrates the alternate configuration of boss 10 which can be incorporated into the same hole saw assembly 10 28. A work piece 24 includes an existing aperture 22 required to be enlarged while dotted line 36 forms an invisible circle perimeter to which enlargement of the aperture 22 is required to extend.

 Using either configuration, the invention allows for a more accurate enlargement of the existing aperture 22 in that the inner hole saw 20 extends a 15 greater distance longitudinally than the outer hole saw 18 and fits snugly within the aperture 22, thereby acting as a guide or pilot for the outer hole saw 18. It is the contact between the outer surface 38 of the inner hole saw cylinder with the inner surface 40 of the aperture 22 that minimises the risk of the outer hole saw 18 unfavourably moving as it makes contact with the work piece surface 26. If it were 20 not for the inner hole saw 20, the rotating motion of the outer hole saw 18 would cause it to gyrate as soon as it makes contact with the work piece surface 26.

 The first configuration of boss 10 shown in Figure 1 simply includes a single diameter threaded member 12 to which firstly the outer 18 and secondly the inner 20 hole saw are screwed, the two hole saws being of different cutting diameter so that 25 one can fit within the other.

 Boss 10 of the second configuration shown in Figures 2-6 engages the outer hole saw 18 with a first threaded section 14. Longitudinally extending from the first threaded section 14 is a second threaded section 16 of stepped down diameter adapted to engage the inner hole saw 20. It is to be understood that in both 30 configurations, the threaded section 14 is fixedly attached to a base member 42, which is adapted to fit to the mandrel 32 using connection means 44 and 46 locked by annulus 34. Furthermore, a central aperture 47 through boss 10 allows drill bit 33 to protrude there through.

The second configuration including a second threaded section 16 of stepped down diameter is provided to accommodate typical hole saws that engage with one of two boss thread sizes, a smaller thread size (typically 1/2") or a larger thread size (typically 5/8"). These cover a wide range of hole saw diameters from relatively small hole saws to larger hole saws. Preferably, the threaded sections 14 and 16 are shaped correspondingly to engage these industry standard threads, however, the boss of the invention should not be limited to these sizes as it could well be used for other functions incorporating thread sizes of a different magnitude. For example, the first threaded section 14 could be used to engage a buffing or grinding wheel (not shown) while the second threaded section 16 could be used to engage a locking bolt (not shown) or the like. Threaded sections for this operation may well differ from those used in a typical hole saw operation.

It is to be also understood that the connection means referred to in this invention need not limit the connection means used, for example, the boss 10 may simply be screwed onto the mandrel 32 whereby both mandrel 32 and base member 42 include engageable threads. Furthermore, any member adapted to be screwed may include flat surfaces adapted to be engaged by a spanner or the like for screwing and unscrewing of the member.

It should be further understood that the lengths of sections 14 and 16 of threaded member 12 are such that two different sized hole saws may well engage only one of the sections. This would occur, for example, when the diameter of the required enlargement perimeter 36 is only slightly larger than that of the existing aperture 22 and therefore hole saws of relatively similar sizes are used.

It should now be apparent to those skilled in the art that the use of either of the two configurations of the boss of the present invention in a hole saw assembly, allows the user of such an assembly, when faced with wanting to enlarge a hole on a work piece to simply reach into their toolbox, pick up two hole saws of the same or different size, screw them onto the boss and proceed with drilling. The invention does away with the need to manually enlarge a hole in a work piece. It further eliminates the need to replace the boss when a hole saw of differing bore size needs to be used and it achieves this by including different sized threads on the one boss.

Further advantages and improvements may very well be made to the present invention without deviating from its scope. Although the invention has been shown and described in what is conceived to be the most practical and preferred

embodiment, it is recognized that departures may be made therefrom within the scope and spirit of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

5 Dated this Friday, March 28, 2003

Kym John Keightley
By his Patent Attorneys
LESICAR PERRIN

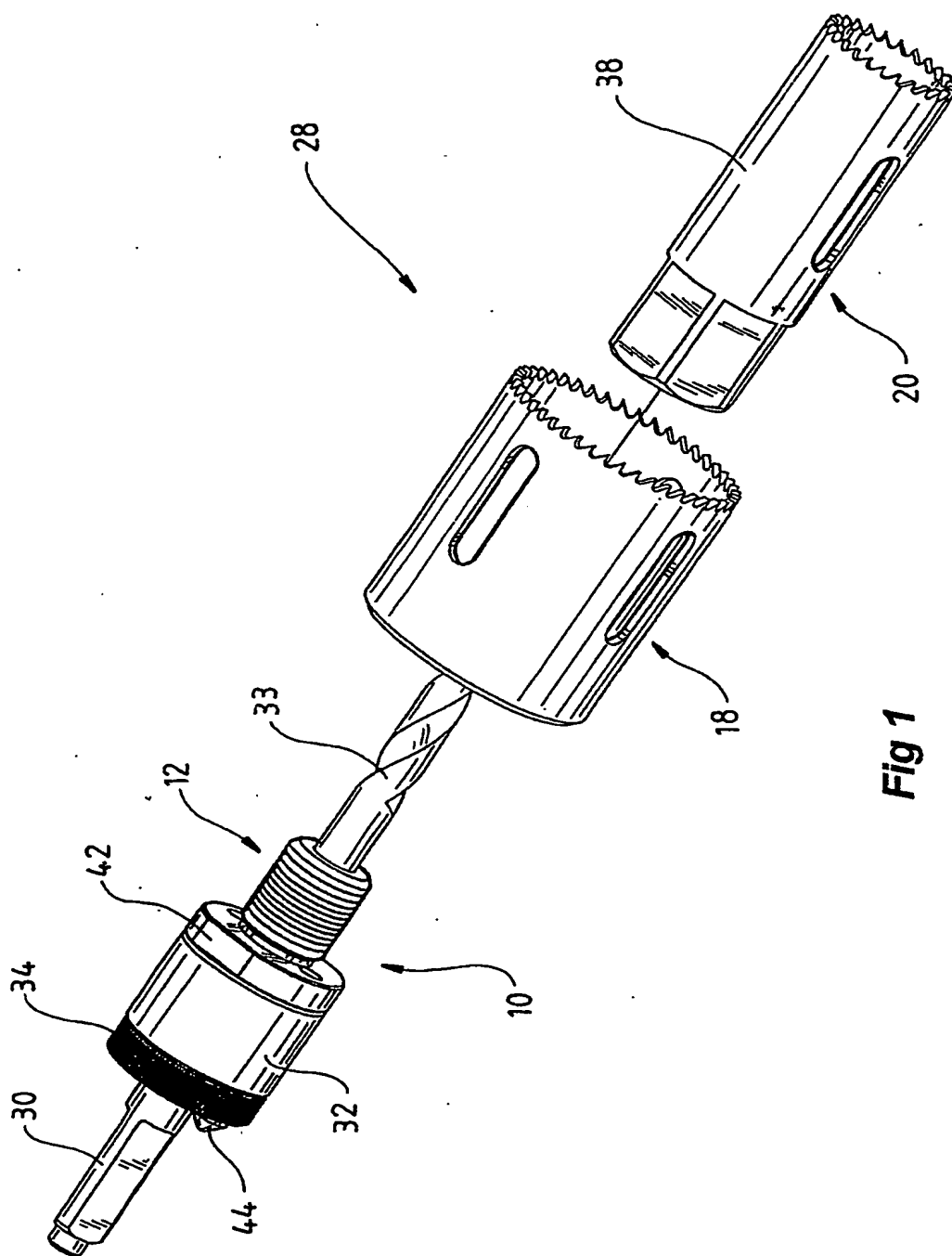
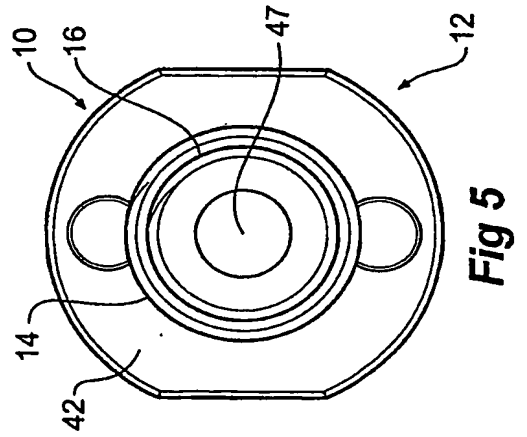
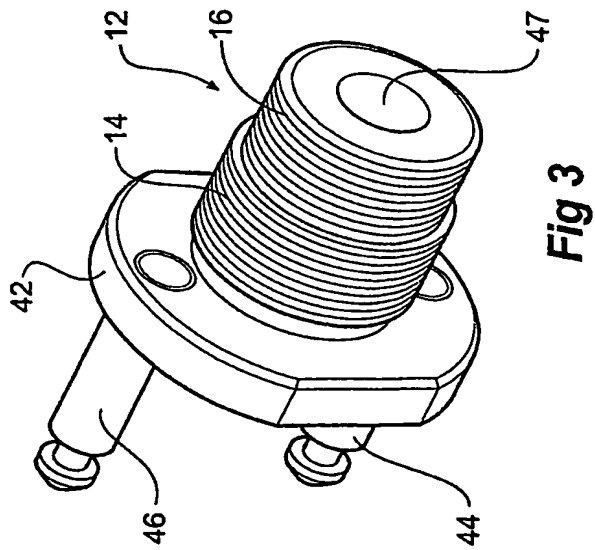
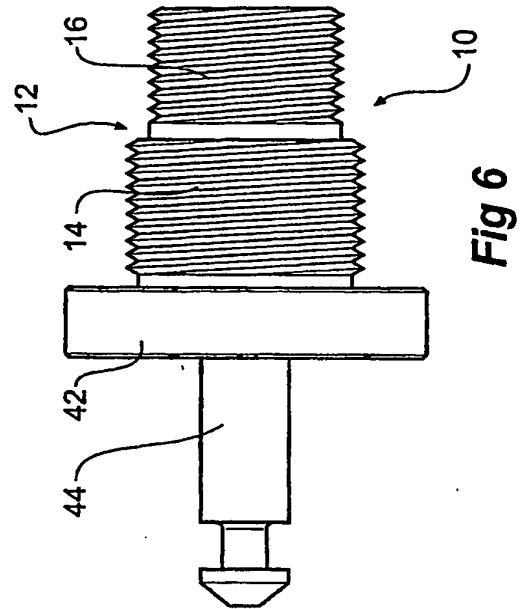
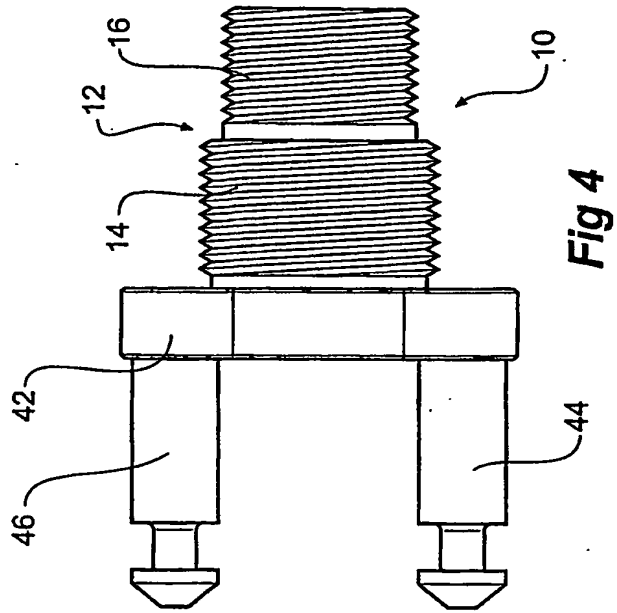


Fig 1

Fig 2



**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.